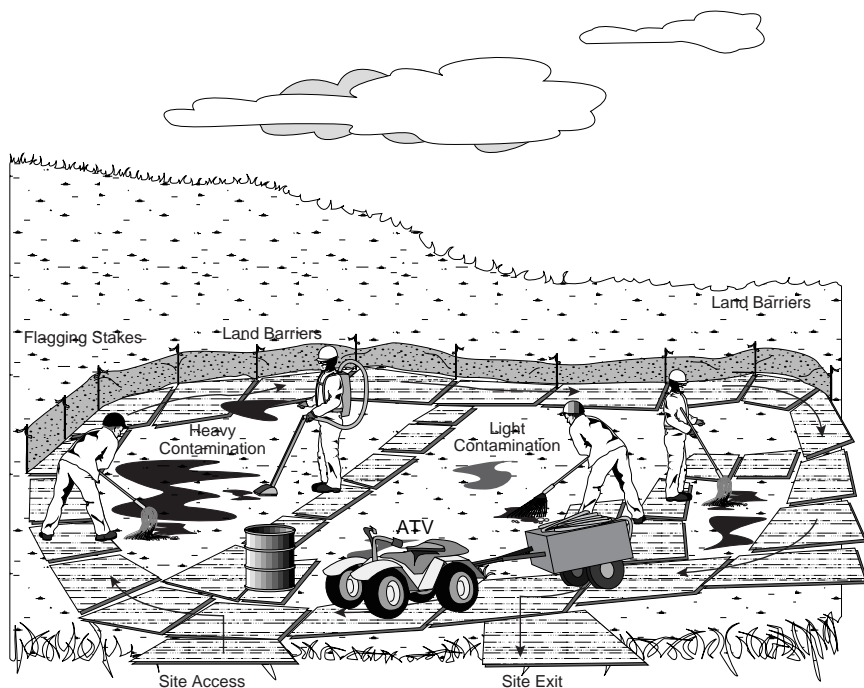


## Minimizing Physical Damage to Tundra

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Physical damage to the tundra can be an unwelcome consequence of treatment. Tundra may be physically damaged by:

- Trampling or repeatedly walking over the same area,
- Driving vehicles or heavy equipment on the tundra when the active layer is thawed, and making repeated trips with heavy equipment when tundra is frozen,
- Excavating (Tactic T-13) or trenching (Tactic T-9),
- Using high-pressure or hot water for flushing (Tactic T-2) or flooding (Tactic T-1), or
- Injuring the root mat while burning (Tactic T-6) or scraping (Tactic T-8), especially when the soil is very dry.

Activities that require vehicles or repeated trips on foot over thawed tundra destroy vegetation and permanently compress organic soils. These ruts or compressed areas may change site drainage patterns, causing drying of some areas and inundation of others. Damage to vegetation and compression or removal of organic soils may result in loss of insulating effects of the tundra surface, which could cause underlying permafrost to thaw and the soil to subside (“thermokarst”). Thermokarst can change dry or moist tundra to wet or aquatic tundra by creating depressions that fill with water and change habitat conditions. Once the thermal regime and drainage of an area are disturbed, the site may remain in the altered state for many years.

Some options for minimizing physical damage to tundra are:

- Limiting travel on tundra as much as possible
- Limiting use of invasive treatment tactics as much as possible
- Using plywood as boardwalks or working platforms for light equipment
- Using snowshoes for repeated trips on foot over the tundra
- Using existing roads as much as possible
- Using existing gravel pads for staging where possible
- Restoring natural contours and drainage by filling excavations
- Replacing removed organic layer with peat or sod
- Tilling highly compressed areas (Tactic T-19) and enhancing revegetation

### APPLICABILITY

	APPLICABILITY	COMMENTS
SPILLED SUBSTANCE	All	
TUNDRA TYPE	All	<ul style="list-style-type: none"> <li>• Generally, wet sites are more easily disturbed by traffic but recover faster than dry sites. Dry sites are less susceptible to damage from traffic than wet sites but recover more slowly.</li> </ul>
SEASON	All	<ul style="list-style-type: none"> <li>• All tundra types are more susceptible to physical damage while the active layer is thawed.</li> </ul>

### CONSIDERATIONS AND LIMITATIONS

- All repetitive foot traffic should be limited to boardwalks whenever possible.
- Boardwalks should be light enough to be moved manually. Boardwalks can be moved as workers concentrate on different areas within the site.
- If treatment tactics require heavy equipment, tundra travel permits and proper road construction may be required (Tactic P-5).